



6560-50-P

**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 51**

**[EPA-HQ-OAR-2012-0393; FRL-9844-3]**

**RIN 2060-AR67**

**Air Quality: Revision to Definition of Volatile Organic Compounds – Exclusion of *trans* 1-chloro-3,3,3-trifluoroprop-1-ene [Solstice™ 1233zd(E)]**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** The EPA is taking final action to revise the regulatory definition of volatile organic compounds (VOCs) for purposes of preparing state implementation plans (SIPs) to attain the national ambient air quality standards (NAAQS) for ozone under title I of the Clean Air Act (CAA). This final action adds *trans* 1-chloro-3,3,3-trifluoroprop-1-ene (also known as Solstice™ 1233zd(E)) to the list of compounds excluded from the regulatory definition of VOCs on the basis that this compound makes a negligible contribution to tropospheric ozone formation. As a result, if you are subject to certain federal regulations limiting emissions of VOCs, your emissions of Solstice™ 1233zd(E) may not be regulated for some purposes. This action may also affect whether Solstice™ 1233zd(E) is considered as a VOC for state regulatory purposes, depending on whether the state relies on the EPA's regulatory definition of VOCs. An exemption for Solstice™ 1233zd(E) was promulgated first as a direct final rulemaking but was withdrawn because EPA received an adverse comment.

**DATES:** This rule is effective on **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER*]**.

**ADDRESSES:** The EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2012-0393. All documents in the docket are listed on the *www.regulations.gov* website. Although listed in the index, some information is not publicly available, i.e., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the Docket ID No. EPA-HQ-OAR-2012-0393, EPA/DC, EPA West, Room 3334, 1301 Constitution Avenue, Northwest, Washington, D.C. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air and Radiation Docket and Information Center is (202) 566-1742. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at: *<http://www.epa.gov/epahome/dockets.htm>*.

**FOR FURTHER INFORMATION CONTACT:** David Sanders, Office of Air Quality Planning and Standards, Air Quality Policy Division, Mail Code C539-01, Research Triangle Park, NC 27711; telephone: (919) 541-3356; fax number: 919-541-0824; email address: *sanders.dave@epa.gov*.

**SUPPLEMENTARY INFORMATION:**

**I. General Information**

*A. Does this action apply to me?*

Entities potentially affected by this final rule include, but are not necessarily limited to, state and local air pollution control agencies that adopt and implement

regulations to control air emissions of VOCs; industries involved in the manufacture or use of refrigerants, aerosol and non-aerosol solvents and blowing agents for insulating foams; and manufacturers of refrigeration equipment, hot water heaters and waste heat recovery equipment. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding FOR FURTHER INFORMATION CONTACT section. This action has no substantial direct effects on industry because it does not impose any new mandates on these entities, but, to the contrary, removes Solstice™ 1233zd(E) from the regulatory definition of VOCs. The use of this compound remains subject to other restrictions under the CAA. Specifically, the use of this compound as an aerosol propellant, blowing agent or refrigerant, or any other use in which it would substitute for chlorofluorocarbons, hydrochlorofluorocarbons or their substitutes, is subject to restrictions under the Significant New Alternatives Policy (SNAP) program (CAA §612; 40 CFR 82 subpart G). The SNAP program has issued final approvals for Solstice™ 1233zd(E) as a suitable foam and refrigerant substitute and as a propellant (74 FR 50129, September 30, 2009; 75 FR 34017, June 16, 2010), and as a solvent for metals, electronics, and precision cleaning and in adhesives, coatings, and inks.

*B. How is this preamble organized?*

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## **II. Background**

### *A. The EPA's VOC Exemption Policy*

Tropospheric ozone, commonly known as smog, is formed when VOCs and nitrogen oxides (NO<sub>x</sub>) react in the atmosphere in the presence of sunlight. Because of the harmful health effects of ozone, the EPA and state governments limit the amount of VOCs that can be released into the atmosphere. VOCs are those organic compounds of carbon that form ozone through atmospheric photochemical reactions. Different VOCs have different levels of reactivity. That is, they do not react to form ozone at the same speed or do not form ozone to the same extent. Some VOCs react slowly or form less ozone; therefore, changes in their emissions have less and, in some cases, very limited effects on local or regional ozone pollution episodes. It has been the EPA's policy that organic compounds with a negligible level of reactivity should be excluded from the regulatory definition of VOCs so as to focus VOC control efforts on compounds that do

significantly increase ozone concentrations. The EPA also believes that exempting such compounds creates an incentive for industry to use negligibly reactive compounds in place of more highly reactive compounds that are regulated as VOCs. The EPA lists compounds that it has determined to be negligibly reactive in its regulations as being excluded from the regulatory definition of VOCs (40 CFR 51.100(s)).

Section 302(s) of the CAA specifies that the EPA has the authority to define the meaning of “VOC,” and hence what compounds shall be treated as VOCs for regulatory purposes. The policy of excluding negligibly reactive compounds from the regulatory definition of VOCs was first set forth in the “Recommended Policy on Control of Volatile Organic Compounds” (42 FR 35314, July 8, 1977) and was supplemented most recently with the “Interim Guidance on Control of Volatile Organic Compounds in Ozone State Implementation Plans” (Interim Guidance) (70 FR 54046, September 13, 2005). The EPA uses the reactivity of ethane as the threshold for determining whether a compound has negligible reactivity. Compounds that are less reactive than, or equally reactive to, ethane under certain assumed conditions may be deemed negligibly reactive and therefore suitable for exemption from the regulatory definition of VOCs. Compounds that are more reactive than ethane continue to be considered VOCs for regulatory purposes and therefore are subject to control requirements. The selection of ethane as the threshold compound was based on a series of smog chamber experiments that underlay the 1977 policy.

The EPA has used three different metrics to compare the reactivity of a specific compound to that of ethane: (i) the reaction rate constant (known as  $k_{OH}$ ) with the hydroxyl radical (OH); (ii) the maximum incremental reactivity (MIR) on a reactivity per

unit mass basis; and (iii) the MIR expressed on a reactivity per mole basis. A full description of each metric and how it is derived can be found in the direct final rulemaking (78 FR 11101, February 15, 2013) and is not repeated here.

*B. Petition to List Solstice™ 1233zd(E) as an Exempt Compound*

Honeywell Inc. submitted a petition to the EPA on July 19, 2011, requesting that Solstice™ 1233zd(E) (CAS number 102687-65-0) be exempted from VOC control based on its low reactivity relative to ethane.<sup>1</sup> The petitioner indicated that Solstice™ 1233zd(E) may be used in a variety of applications, including as a solvent in aerosol and non-aerosol applications, as a blowing agent in insulating foams for refrigerators/freezers and hot water heaters and as a refrigerant in commercial chillers and waste heat recovery (Rankin cycle) systems. A fuller description of the petition regarding Solstice™ 1233zd(E), including a discussion of other compounds for which it would substitute, is found in the direct final rulemaking (78 FR 11101, February 15, 2013) and is not repeated here.

*C. Contribution to Tropospheric Ozone*

Detailed information on the ozone reactivity of Solstice™ 1233zd(E) was presented in the direct final rulemaking (78 FR 11101, February 15, 2013) and is summarized here.

Solstice™ 1233zd(E) has a higher  $k_{OH}$  value than ethane, meaning that it initially reacts more quickly in the atmosphere than ethane. However, a molecule of Solstice™ 1233zd(E) is less reactive than a molecule of ethane in terms of complete ozone forming

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<sup>1</sup> *Trans* 1-chloro-3,3,3-trifluoroprop-1-ene will also be marketed by Honeywell under the trade names Solstice™ N12 Refrigerant, Solstice™ Liquid Blowing Agent (Solstice™ LBA), and Solstice™ Performance Fluid.

activity as shown by the molar-based MIR (g O<sub>3</sub>/mole VOC) values. Also, a gram of Solstice™ 1233zd(E) has a lower MIR value than a gram of ethane. Thus, under the Interim Guidance, Solstice™ 1233zd(E) is eligible to be exempted from the regulatory definition of VOCs, based on both mass-based and molar-based MIR.

#### *D. Health and Environmental Risks*

The preamble to the direct final rulemaking (78 FR 11101, February 15, 2013) provided background information on the Premanufacture Notice (PMN) review and SNAP program review of Solstice™ 1233zd(E). That preamble also presented other information relevant to any potential health or environmental risks. This information is summarized here.

As a chemical not yet introduced into commerce, Solstice™ 1233zd(E) completed a PMN review on January 30, 2012. After considering all relevant data currently available, the EPA was unable to find any unreasonable risks to human health or the environment from the expected use of the substance. Based on this finding, the EPA did not find it necessary to take any actions to prevent unreasonable risk under the Toxic Substance Control Act (TSCA).

The SNAP program review of Solstice™ 1233zd(E) described the potential health effects of Solstice™ 1233zd(E) as being common to many refrigerants, foam agents and solvents, including many of those already listed as acceptable under SNAP. Potential health effects of this substitute include serious eye irritation, skin irritation and frostbite. EPA anticipates that users will be able to meet the manufacturer's recommended workplace exposure limit and address potential health risks by following requirements and recommendations in the material safety data sheet and in any other safety precautions

common to the refrigeration and air conditioning industry, the foam blowing industry and the solvent-based cleaning industry and common when using adhesives and coatings.<sup>2</sup>

Solstice™ 1233zd(E) is not flammable. Solstice™ 1233zd(E) is not expected to undergo wet or dry deposition to an appreciable extent.

Solstice™ 1233zd(E) has a 100-yr global warming potential (GWP) reported as 4.7 to 7 and an atmospheric lifetime of approximately 26 to 31 days or less. The net GWP effect of increased use of Solstice™ 1233zd(E) in place of certain other compounds will be advantageous.

### **III. Proposed Action and Response to Comments**

Based on both the mass and molar MIR values for Solstice™ 1233zd(E) being equal to or less than that of ethane, the EPA issued a direct final rule (78 FR 11101, February 15, 2013) and a parallel notice-and-comment proposal (78 FR 11119, February 15, 2013) to find that Solstice™ 1233zd(E) is “negligibly reactive” and to exempt Solstice™ 1233zd(E) from the regulatory definition of VOCs at 40 CFR 51.100(s).

Comments: The EPA received three comments on the parallel notice-and-comment proposal during its comment period. Only one commenter, an individual, expressed reservations about the proposed exemption.<sup>3</sup> This commenter believes that the low ozone reactivity of Solstice™ 1233zd(E) is not sufficient to exempt it from the regulatory definition of VOCs in light of what the commenter says are its hazards to

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<sup>2</sup> Since publication of the direct final rule and parallel proposed rule, the SNAP program found Solstice™ 1233zd(E) acceptable for use as a solvent for metals, electronics, and precision cleaning and in adhesives, coatings, and inks (78 FR 29034, May 17, 2013). The SNAP program is currently still reviewing Solstice™ 1233zd(E) for use as a refrigerant for non-mechanical heat transfer.

<sup>3</sup> The EPA considered this comment to be an adverse comment and accordingly withdrew the direct final rule before it became effective. 78 FR 23149, April 18, 2013.



humans and the environment. The commenter characterizes Solstice™ 1233zd(E) as being a toxin and a halogen and notes that it has an occupational exposure limit (OEL) of 300 parts per million (ppm). The commenter says that removing Solstice™ 1233zd(E) from the regulatory definition of VOCs would trivialize the safety hazards posed by its use and that keeping Solstice™ 1233zd(E) within the regulatory definition of VOCs would incline people who work near and on it to treat it with caution.

Two comments, one from the petitioner Honeywell and the other from an individual, supported the proposed exemption. Honeywell's comments directly address the assertions made by the commenter who expressed the reservations noted above. Honeywell notes that Solstice™ 1233zd(E) does not meet the common definition of a "toxin" and that it is not itself a halogen. Honeywell also explains that the OEL of 300 ppm is Honeywell's own recommendation and that this level is higher than three other particular chemicals that have already been excluded from the regulatory definition of VOCs. Honeywell states that Solstice™ 1233zd(E) is not a listed chemical substance in the regulations of the Occupational Safety and Health Administration (OSHA), nor would it be classified as acutely toxic based on OSHA health hazard criteria. Honeywell also notes that Solstice™ 1233zd(E) is not a hazardous air pollutant under the Clean Air Act.

EPA Response: The EPA agrees with the factual information provided in the comments from Honeywell. The EPA notes that the only fact cited in the single adverse comment is that the (Honeywell-recommended) OEL for Solstice™ 1233zd(E) is 300 ppm. The commenter does not argue or present any evidence that exposures to workers or the public will approach this level. The EPA does not agree that keeping Solstice™ 1233zd(E) within the regulatory definition of VOCs would increase worker or public

awareness of its potential toxicity at high exposure levels or help them to limit their exposures, in the context of other mechanisms operating to inform and protect workers and the public from high exposures, because such individuals are unlikely to be aware of the details of the EPA's regulatory definition of VOCs and because individuals do not necessarily associate mere qualification as a VOC with hazard. There are more direct and customary ways for people likely to be exposed to the chemical to become aware of needed precautions (e.g., material safety data sheets). Issues of workplace exposure were considered in the EPA's reviews of this compound under the PMN and SNAP program and the EPA felt that existing measures were appropriate to prevent unreasonable risk.

As stated previously, the EPA finds that Solstice™ 1233zd(E) qualifies as negligibly reactive with respect to its contribution to tropospheric ozone formation. In addition, we believe that risks not related to tropospheric ozone associated with currently allowed uses of the chemical are acceptable and that any new or increased risk from potential new uses are adequately addressed by other existing programs and policies, specifically the SNAP program. We also believe that the comparable or lower GWP of Solstice™ 1233zd(E) compared to other acceptable substitutes is an additional reason to approve the Solstice™ 1233zd(E) petition given that applying the Interim Guidance itself supports such approval.

#### **IV. Final Action**

The EPA is taking final action to approve the petition for exemption of Solstice™ 1233zd(E) from the regulatory definition of VOCs.

If an entity uses or produces Solstice™ 1233zd(E) and is subject to the EPA regulations limiting the use of VOC in a product other than an aerosol coating, limiting

the VOC emissions from a facility, or otherwise controlling the use of VOC for purposes related to attaining the ozone NAAQS, then the compound will not be counted as a VOC in determining whether these regulatory obligations have been met. Emissions of this compound will not be considered in determining whether a proposed new or modified source triggers the applicability of Prevention of Significant Deterioration (PSD) requirements, in areas where the PSD program is implemented by the EPA or a delegated state, local or tribal agency. This action may also affect whether Solstice™ 1233zd(E) is considered as a VOC for state regulatory purposes to reduce ozone formation, if a state relies on the EPA's regulatory definition of VOCs. States are not obligated to exclude from control as a VOC those compounds that the EPA has found to be negligibly reactive. However, states may not take credit for controlling these compounds in their ozone control strategies.

This action is consistent with the Interim Guidance in that two of the three reactivity metric values for Solstice™ 1233zd(E) compare favorably to the corresponding values for ethane. This action is also supported by our inability in the Premanufacture Notification Review Program to find any unreasonable risks to human health or the environment from the expected use of the substance, our finding in the SNAP program review of this chemical that use of this chemical in currently allowed applications poses lower or comparable overall risk to human health and the environment than other acceptable options for the same uses, and on our confidence that the SNAP program would prevent the use of this chemical in any additional applications subject to review by the SNAP program where such use would pose a significant risk to human health or the environment.

## **V. Statutory and Executive Order Reviews**

### *A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review*

This action is not a “significant regulatory action” under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011).

### *B. Paperwork Reduction Act*

This action does not impose an information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. Burden is defined at 5 CFR 1320.3(b). It does not contain any recordkeeping or reporting requirement.

### *C. Regulatory Flexibility Act*

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations and small governmental jurisdictions.

For purposes of assessing the impacts of this action on small entities, small entity is defined as: (1) a small business as defined by the Small Business Administration (SBA) regulation (see 13 CFR 121.201); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant adverse economic impact on small entities, since the primary purpose of the regulatory flexibility analyses is to identify and address regulatory alternatives "which minimize any significant economic impact of the rule on small entities." 5 USC 603 and 604. Thus, an agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule. This final rule removes Solstice™ 1233zd(E) from the regulatory definition of VOCs and thereby relieves users of the compound from requirements to control emissions of the compound. We have, therefore, concluded that today's final rule will relieve regulatory burden for all affected small entities.

#### *D. Unfunded Mandates Reform Act*

This action contains no federal mandates under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531-1538 for state, local or tribal governments or the private sector. The action imposes no enforceable duty on any state, local or tribal governments or the private sector. Therefore, this action is not subject to the requirements of sections 202 and 205 of the UMRA.

This action is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. This final rule removes Solstice™ 1233zd(E) from the regulatory

definition of VOCs and thereby relieves users of the compound from requirements to control emissions of the compound.

*E. Executive Order 13132: Federalism*

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This final rule removes Solstice™ 1233zd(E) from the regulatory definition of VOCs and thereby relieves users from requirements to control emissions of the compound. Thus, Executive Order 13132 does not apply to this rule.

*F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments*

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). It would not have substantial direct effects on tribal governments, on the relationship between the federal government and Indian Tribes, or on the distribution of power and responsibilities between the federal government and Indian Tribes, as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this rule.

*G. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks*

This action is not subject to EO 13045 (62 FR 19885, April 23, 1997) because it is not economically significant as defined in EO 12866. While this final rule is not subject to the Executive Order, the EPA has reason to believe that ozone has a disproportionate

effect on active children who play outdoors (62 FR 38856; 38859, July 18, 1997). The EPA has not identified any specific studies on whether or to what extent Solstice™ 1233zd(E) may affect children's health.

*H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution or Use*

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

*I. National Technology Transfer and Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law 104-113, section 12(d), (15 U.S.C. 272 note) directs the EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs the EPA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable voluntary consensus standards. This rulemaking does not involve technical standards. Therefore, the EPA has not considered the use of any voluntary consensus standards.

*J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*

Executive Order (EO) 12898 (59 FR 7629, Feb. 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part

of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority populations and low-income populations in the United States.

The EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it will not affect the level of protection provided to human health or the environment.

#### *K. Congressional Review Act*

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. The EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives and the Comptroller General of the United States prior to publication of the rule in the *Federal Register*. A major rule cannot take effect until 60 days after it is published in the *Federal Register*. This action is not a “major rule” as defined by 5 U.S.C. 804(2). This rule will be effective on **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER*]**.

#### *L. Judicial Review*

Under section 307(b)(1) of the CAA, petitions for judicial review of this action must be filed in the United States Court of Appeals for the District of Columbia Circuit



Court within 60 days from the date the final action is published in the *Federal Register*.

Filing a petition for review by the Administrator of this final action does not affect the finality of this action for the purposes of judicial review nor does it extend the time within which a petition for judicial review must be final, and shall not postpone the effectiveness of such action. Thus, any petitions for review of this action related to the exemption of Solstice™ 1233zd(E) from the regulatory definition of VOCs must be filed in the Court of Appeals for the District of Columbia Circuit within 60 days from the date final action is published in the *Federal Register*.

List of Subjects in 40 CFR Part 51

Environmental protection, Administrative practice and procedure, Air pollution control, Ozone, Reporting and recordkeeping requirements, Volatile organic compounds.

Dated: August 16, 2013

Gina McCarthy,  
Administrator.

For reasons set forth in the preamble, part 51 of chapter I of title 40 of the Code of Federal Regulations is amended as follows:

**PART 51-REQUIREMENTS FOR PREPARATION, ADOPTION, AND  
SUBMITTAL OF IMPLEMENTATION PLANS**

1. The authority citation for Part 51, Subpart F, continues to read as follows:

Authority: 42 U.S.C. 7401, 7411, 7412, 7413, 7414, 7470-7479, 7501-7508, 7601, and 7602.

**§ 51.100 – [Amended]**

2. Section 51.100 is amended at the end of paragraph (s)(1) introductory text by removing the words “and perfluorocarbon compounds which fall into these classes:” and adding in their place the words “*trans* 1-chloro-3,3,3-trifluoroprop-1-ene; and perfluorocarbon compounds which fall into these classes:”.